

Florida Department of Education

COURSE DESCRIPTION - GRADES 9-12, ADULT

Subject Area: Science
Course Number: 2000360
Course Title: Anatomy and Physiology Honors
Credit: 1.0

Will meet graduation requirements for Science

- A. Major Concepts/Content.** The purpose of this course is to enable students to develop understanding of the relationships between the structures and functions of the human body.

The content should include, but not be limited to, the following:

- implementation of scientific habits of mind
- application of scientific knowledge, methodology, and historical context to solve problems
- use of laboratory technologies
- terminology
- cells and tissues
- homeostasis
- human genetics, growth, and development
- body composition, structure, and function
- internal and external changes and responses
- connections between anatomy, physiology, medicine, technology, society, and the environment

This course shall integrate the Goal 3 Student Performance Standards of the Florida System of School Improvement and Accountability as appropriate to the content and processes of the subject matter.

Course student performance standards must be adopted by the district, and they must reflect appropriate Sunshine State Standards benchmarks.

- B. Special Note.** Laboratory investigations of selected topics in the content, which also include use of the scientific method, measurement, laboratory apparatus, and safety procedures, are an integral part of this course. Inquiry into current technology and applications of anatomical and physiological principles and their relationship to the environment is encouraged.

Students earning credit in 2000360 - Anatomy and Physiology Honors may not earn credit in 2000350 - Anatomy and Physiology.

The course requirements for this honors course are consistent with 2000350 - Anatomy and Physiology. The district shall develop a description of additional requirements to provide in-depth or enriched study of the course requirements.

- C. Course Requirements.** These requirements include, but are not limited to, the benchmarks from the Sunshine State Standards that are most relevant to this course. Benchmarks correlated with a specific course requirement may also be addressed by other course requirements as appropriate. Some requirements in this course are not addressed in the Sunshine State Standards.

Benchmarks from Science, Strand H, should not be taught and assessed in isolation, but should be combined with other benchmarks identified in this course description.

Content related to disease process and immune response should be embedded in the study of the appropriate system.

After successfully completing this course, the student will:

- 1. Demonstrate effective implementation of scientific habits of mind.**
- 2. Apply knowledge of the nature of science, scientific methodology, and historical context to solve problems, and employ safe and effective use of laboratory technologies.**
 - SC.H.1.4.1 know that investigations are conducted to explore new phenomena, to check on previous results, to test how well a theory predicts, and to compare different theories.

- SC.H.1.4.2 know that from time to time, major shifts occur in the scientific view of how the world works, but that more often the changes that take place in the body of scientific knowledge are small modifications of prior knowledge.
- SC.H.1.4.3 understand that no matter how well one theory fits observations, a new theory might fit them as well or better, or might fit a wider range of observations, because in science, the testing, revising, and occasional discarding of theories, new and old, never ends and leads to an increasingly better understanding of how things work in the world, but not to absolute truth.
- SC.H.1.4.4 know that scientists in any one research group tend to see things alike and that therefore scientific teams are expected to seek out the possible sources of bias in the design of their investigations and in their data analysis.
- SC.H.1.4.5 understand that new ideas in science are limited by the context in which they are conceived, are often rejected by the scientific establishment, sometimes spring from unexpected findings, and usually grow slowly from many contributors.
- SC.H.1.4.6 understand that, in the short run, new ideas that do not mesh well with mainstream ideas in science often encounter vigorous criticism and that, in the long run, theories are judged by how they fit with other theories, the range of observations they explain, how well they explain observations, and how effective they are in predicting new findings.
- SC.H.1.4.7 understand the importance of a sense of responsibility, a commitment to peer review, truthful reporting of the methods and outcomes of investigations, and making the public aware of the findings.
- SC.H.2.4.1 know that scientists assume that the universe is a vast system in which basic rules exist that may range from very simple to extremely complex, but that scientists operate on the belief that the rules can be discovered by careful, systemic study.

SC.H.2.4.2 know that scientists control conditions in order to obtain evidence, but when that is not possible for practical or ethical reasons, they try to observe a wide range of natural occurrences to discern patterns.

3. Demonstrate use of correct anatomic terminology for body regions, planes, and directions.

4. Demonstrate understanding of cell function and structure in healthy and diseased tissue.

SC.F.1.4.3 know that membranes are sites for chemical synthesis and essential energy conversions.

SC.F.1.4.5 know that complex interactions among the different kinds of molecules in the cell cause distinct cycles of activity governed by proteins.

5. Demonstrate understanding of the nature of homeostasis.

SC.F.1.4.1 know that the body processes involve specific biochemical reactions governed by biochemical principles.

SC.F.1.4.4 understand that biological systems obey the same laws of conservation as physical systems.

6. Demonstrate knowledge of genetics, development, growth, and maturation of the human body and its systems.

SC.F.2.4.2 know that every cell contains a “blueprint” coded in DNA molecules that specify how proteins are assembled to regulate cells.

7. Demonstrate understanding of the composition, active chemical compounds, structure, function, and dysfunction of the human body.

SC.F.1.4.2 know that body structures are uniquely designed and adapted for their function.

SC.F.1.4.6 know that separate parts of the body communicate with each other using electrical and/or chemical signals.

SC.F.1.4.7 know that organisms respond to internal and external stimuli.

8. Demonstrate understanding of conditions that cause change in normal body functions (e.g., injury, infection, mutation, metabolic disorder) and the response of the body to those conditions (e.g., inflammatory response, clotting, immune response).

SC.F.1.4.8 know that cell behavior can be affected by molecules from other parts of the organism or even from other organisms.

9. Demonstrate knowledge of the connections of anatomy, physiology, and medicine with technology, society, and the environment.

SC.H.3.4.1 know that performance testing is often conducted using small-scale models, computer simulations, or analogous systems to reduce the chance of system failure.

SC.H.3.4.2 know that technological problems often create a demand for new scientific knowledge and that new technologies make it possible for scientists to extend their research in a way that advances science.

SC.H.3.4.3 know that scientists can bring information, insights, and analytical skills to matters of public concern and help people understand the possible causes and effects of events.

SC.H.3.4.4 know that funds for science research come from federal government agencies, industry, and private foundations and that this funding often influences the areas of discovery.

SC.H.3.4.5 know that the value of a technology may differ for different people and at different times.

SC.H.3.4.6 know that scientific knowledge is used by those who engage in design and technology to solve practical problems, taking human values and limitations into account.